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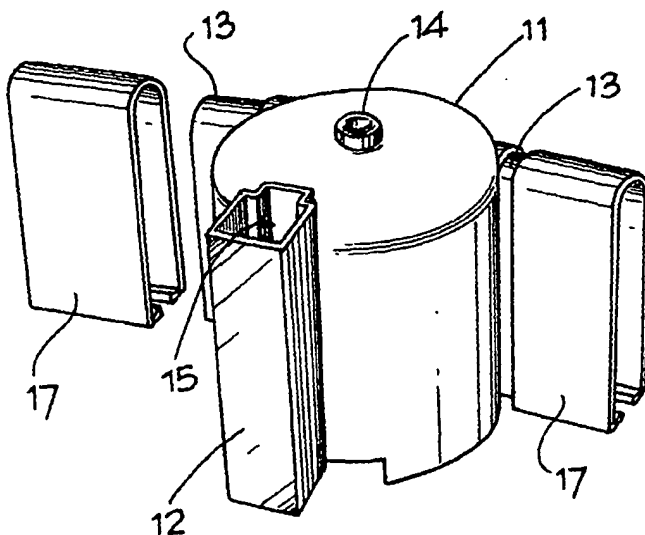
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(54) Title: PROTECTION DEVICE FOR THREAD SUPPLIERS TO KNITTING MACHINES AND SIMILAR



(57) Abstract: This invention concerns a protection device for thread-feeding devices used in textile and knitting machines. It consists of a protection hood (11) for covering one or more pulleys of a feeder or supplier, at least one projection (12) to one side of the hood, designed to fasten the latter to the body of the feeder or supplier, two branches (13) on either side for covering or protecting the parts of the belt or belts near to the hood, and of several extension elements (17) that move along the branches (13) to cover and protect the remaining parts of the belt or belts between successive feeder or supplier elements.

WO 01/18295 A1

**PROTECTION DEVICE FOR THREAD SUPPLIERS TO**  
**KNITTING MACHINES AND SIMILAR**

**Field of the invention**

This invention concerns the sector of textile and knitting machines or similar, which work numerous threads that are fed by their respective feeders or suppliers.

5      **State of the art**

These feeder or supplier devices for machines used in making textile or knitted products essentially consist of a support body, a thread reel mounted and rotating on said body, at least one pulley that engages with a timing belt in  
10      order to rotate the thread reel, and of several means for detecting the thread presence.

In circular knitting machines, especially, the thread feeder or supplier devices are normally fixed onto at least one ring support, which is concentric with the machine axis, and the

devices of the said support are driven contemporarily by at least one belt.

Generally, when these feeder or supplier devices are set in place, they have no physical protection and, therefore, are completely exposed to the surrounding environment. Although this may facilitate access and maintenance of individual devices, it also represents a source of inconvenience.

In fact, when the devices are exposed like this, not only do they collect dust and stray filaments, but they represent a source of danger for operators as well as being areas that could catch objects, tools or other apparatus which is present and in use in the same workplace as the machinery to which these devices are applied.

#### Aim and brief description of the invention

The main aim of this invention is to overcome the above-mentioned inconveniences with a protection device that is capable of covering said thread feeder or supplier devices, at least at the level of the one or more pulleys and the command belt or belts, in such a way as to prevent interference with external objects, creating a protection barrier and keeping the supplier devices clean.

Said aim is achieved by means of a protection device for thread supplier devices used in knitting machines and similar, which consists of a covering hood for the one or

more pulleys of the feeder or supplier, a side projection from the hood for fastening this to the body of the feeder or supplier, and two lateral branches that extend to either side of said hood and which are designed to cover and protect the command belt or belts of the feeder.

Ideally, the device is moulded in plastic and then mounted directly onto the support body of a feeder or supplier, without interfering with any of the other parts of the textile or knitting machine.

It is best if the device can be varied in height above the respective feeder or supplier in order to give access for maintenance purposes, for adjusting the belts, etc., without having to completely remove the protection.

The device is equipped with at least one means for guiding the height, which also prevents the rotation of the device when it is raised.

Furthermore, the device also has a height limiter and a spring for blocking and stabilising the device when it is in both the lowered and raised position.

The lateral branches on the hood are coupled with extensions that can move longitudinally to form a continuous whole with the adjacent devices and completely covering the belt or belts, said extensions being movable upwards, together with their respective hoods, without becoming detached.

The lower part of the hood may be furnished with seats or hollows in order to accommodate part of the support body of the feeder or supplier and to lower the hood even further onto said body and provide greater protection for the equipment.

Last but not least, the top of the hood has a fitting for connecting a tube from a blowing or suction machine for cleaning powder, filaments, etc. from the device and the belt or belts.

#### Brief description of the drawings

The enclosed drawings are illustrative but not binding and show various models of the invention; they are described in greater detail here below, where:

Fig. 1 shows the perspective of a device, complete with lateral extensions;

Fig. 2 shows a view from above;

Fig. 3 shows the device applied to one type of supplier;

Fig. 4 shows the device adapted to fit another type of supplier; and

Fig. 5 shows a plan of two adjacent suppliers, united by means of extensions.

#### Detailed description of the invention

The protection device of this invention is made in plastic and has a hood 11 in the shape of a dome with, on one side, at least one tubular projection 12 and, on the other side and

facing one another, two lateral branches 13.

On its top, the hood 11 has at least one hole 14 to which a fitting may be attached for connecting a tube for blowing or sucking air. This enables fibres and dust to be collected and transported by appropriate collectors to a filtering apparatus, designed to block waste, etc. Ideally, there should also be a tube 11a, stretching from said fitting and ending in a blowing nozzle 11b, at the level of a thread brake 11c.

The tubular projection 12 is parallel to the geometric axis of the dome-shaped hood 11 and defines an axial through-hole 15, with non-cylindrical cross-section, partially closed at the bottom by a collar 16.

The two lateral branches 13 are essentially at right angles to the hood, on the opposite side to that of the projection. Each branch 13 is in the shape of an up-turned U, with the open part facing downwards and towards the inside of the hood. Straddling each branch 13, there is an extension element 17, which also has an up-turned U shape, fastened to the lower edge of the branch itself in order to block it vertically but leaving it free to run horizontally.

Such a protection device can be applied to thread feeders or suppliers 20, which are usually fixed onto a support ring, on board textile or knitting machines. Each feeder or supplier 20 consists, as is already known – see Figs 3 and 4 – of a support body 21, a thread reel 22 mounted on and

rotating on said body, one or more pulleys 23 mounted on the axis of the reel 22 and of means for detecting the thread presence 24. At least one timing belt 25, driven by a motor – not shown – and sent back over the pulleys is used to rotate several feeder or supplier machines at the same time.

The protection device is fixed directly onto the support body 21 of its respective apparatus 20 by means of a support and guide column 26. This column 26 is housed in the axial hole in the projection 12 of the hood 11, and then fixed to the support body 21 by means of a central bottom screw 27 – Fig. 3.

The hood 11 covers the pulley of the appliance placed above the support body; the lateral branches 13 cover the timing belt or belts 25; the extensions 17 can be moved, when necessary, along the branches 13 in order to cover even the parts of the timing belt or belts between successive branches of the covering hoods of adjacent appliances – Fig. 5.

The hood 11, with the projection 12 and the lateral branches, will have a height that depends on the height of the appliance 20 above the respective support body 21. One example of the appliance 20 with a first height is shown in Fig. 3, while another example of the appliance 20, with a greater height and an intermediate support pole, is shown in Fig. 4. In this second case, it will be possible to use a

protection device suitable for the lower appliance in Fig. 3, with the addition of a base or platform 28, which also envelopes the appliance.

5 In either case, the device can be moved in height independently, from a lower position to a raised one with respect to the protected appliance. In the lowered position, the device rests on the support body of the appliance; the base of the hood may be furnished with seats or hollows 11, in order to lower the protection even further over the  
10 appliance. In the raised position, the protection uncovers the appliance in order to give access to it. It should be noted that the lateral extensions 17, which are fastened vertically to the branches, always follow the up and down movements of the device.

15 The guide column 26 has a non-cylindrical head 26', the same shape as the axial hole 15 in the projection 12 of the hood, into which it fits in order to prevent the protection from rotating around the column, defining the correct orientation of the hood so that it can cover its respective  
20 appliance.

Furthermore, the head 26', by interacting with the collar 16 located at the bottom of said hole 15, restricts the upward movement of the protection, preventing it from becoming detached from the protected appliance, even when it is  
25 completely raised.



Finally, it should be noted that between the column 26 and the projection 12 of the hood 11 there is a spring 29 which firmly blocks the protection, both in the lowered and the raised position.

### CLAIMS

1. Protection device for thread feeder or supplier  
appliances used in textile or knitting machines, where  
the feeders or suppliers are fixed to a ring support and  
each has a support body, a thread reel mounted and  
rotating on said body and one or more pulleys on the  
axis of said reel, which engage at least one toothed  
command belt, characterised by the fact that they  
consist of a protection hood (11) for covering the one  
or more pulleys of a feeder or supplier, at least one  
projection (12) to one side of said hood which is  
designed to fasten the latter to the support body of  
said feeder or supplier, two lateral and facing  
branches (13) for covering and protecting the parts of  
the belt or belts near the hood, and extension elements  
(17) that can move along said branches (13) in order  
to cover and protect the remaining parts of the belt or  
belts between adjacent feeder or supplier appliances.
2. Device according to claim 1, in which said hood (11)  
with said projection (12) and said branches are made  
in plastic or other material, in which said projection  
(12) is parallel to the geometric axis of the hood and  
said branches (13) are set at right angles to this and at  
the opposite side to the projection.
3. Device according to claims 1 and 2, in which the

projection (12) has at least one axial hole (15), with an internal collar for tightening (16) in the lower part, said hole (15) housing a guide column (26) that constitutes a means of fastening the protection to the body of the appliance to be protected.

5

4. Device according to claim 3, in which said guide column (26) is fixed vertically onto the support body of the appliance to be protected and has a non-cylindrical head (26'), which prevents the protection from rotating and which is designed to be held by the restraining collar (16) inside the hole (15) in the projection (12), the protection being movable between a lowered and a raised position above the appliance to be protected, the raised position being defined by said head (26') with said collar (16).

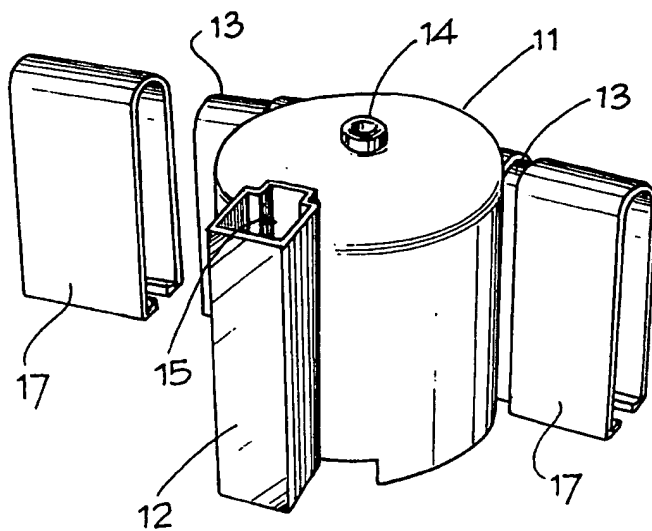
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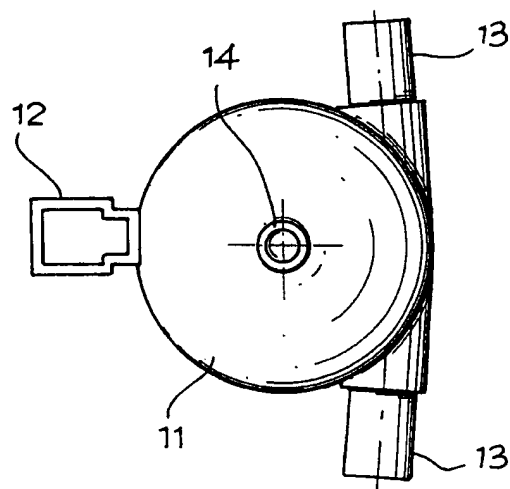
5. Device according to claim 4, in which a blocking spring (29), placed between the guide column (26) and the projection (12) is designed to hold the protection in both the lowered and the raised position.
6. Device according to any of the above claims, in which the hood (11) has at least one hole in the top (14), with a joint for connecting it to a tube for blowing or sucking air and/or a tube with a blowing nozzle (11b) at the level of a means for driving the thread or threads.

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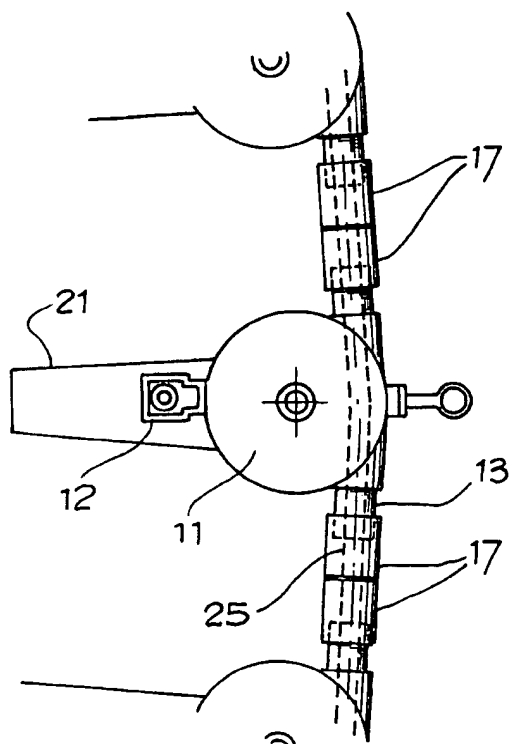
7. Device according to any of the previous claims, in which each extension element (17) is limited in height by the respective branch of the hood, which it follows in its up and down movements, each extension element being able to run horizontally along its  
5       respective branch in order to vary its coverage.



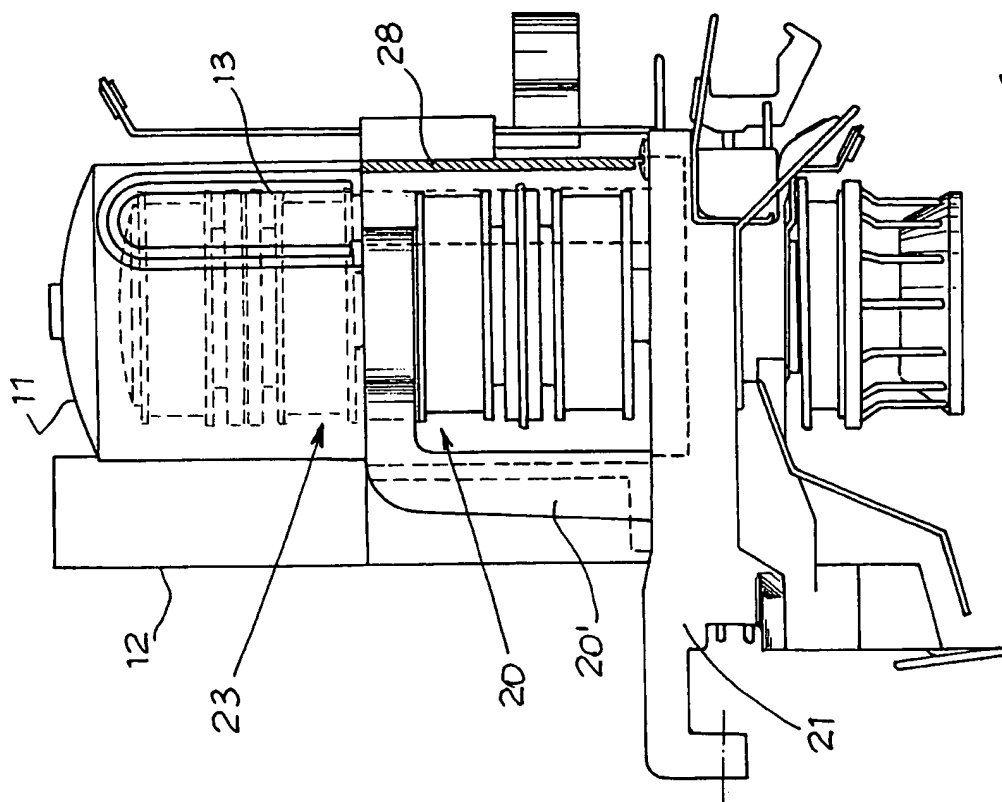
*Fig. 1*



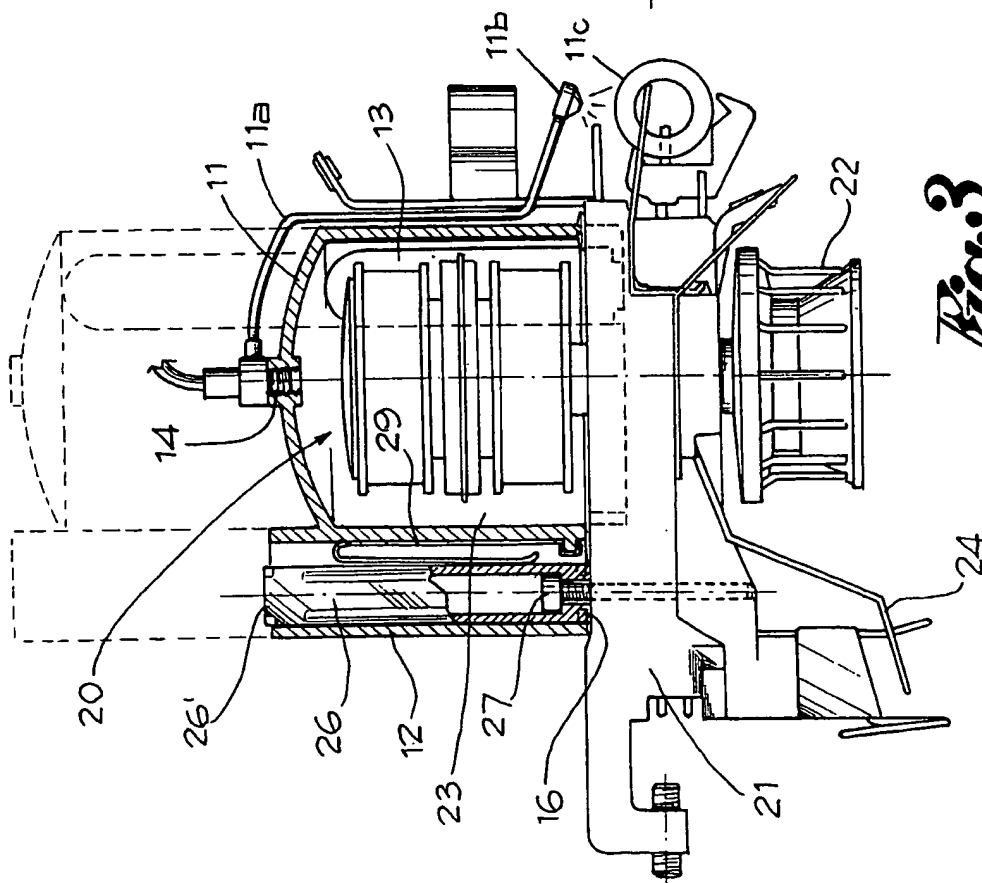
*Fig. 2*



*Fig. 5*



*Fig. 4*



*Fig. 3*

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 00/00353

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 D04B15/48

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D04B B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 40 16 934 A (MEMMINGER-IRO GMBH) 28 November 1991 (1991-11-28) column 5, line 2 - line 39; claim 15; figures 1-6	1,6
A	GB 655 858 A (HEMPHILL COMPANY) page 3, line 4 - line 57; figures 1,2	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

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- \*E\* earlier document but published on or after the international filing date
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4016934	A	28-11-1991	NONE
GB 655858	A		NONE